

A1 and A2
thus recording dots made of the ink droplets.

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A2
4. (Amended) A recording head having a plurality of heating elements as driving elements for ejecting ink droplets from a plurality of nozzles, the plurality of heating elements being arranged in a direction substantially perpendicular to the direction of carrying a carried recording medium, the recording head comprising:

time-division driving means for dividing the plurality of heating elements into a plurality of blocks, each block consisting of a predetermined number of spatially arranged heating elements of the plurality of heating elements corresponding to the plurality of nozzles, and sequentially driving each set of heating elements simultaneously driven over the respective blocks, in a time-divisional manner, consecutive ones of the heating elements being disposed sufficiently adjacent to one another to cause cross-talk therebetween; and

recording means for ejecting ink droplets from the nozzles corresponding to the driven heating elements and impacting the ink droplets on the recording medium, thus recording dots made of the ink droplets.

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7. (Amended) An ink jet printer having a recording head having a plurality of heating elements as driving elements for ejecting ink droplets from a plurality of nozzles, the plurality of heating elements being arranged in a direction substantially perpendicular to the direction of carrying a carried recording medium, the ink jet printer being adapted for recording information including a character and/or an image in the form of dots made of ink droplets, the ink jet printer comprising:

time-division driving means for dividing the plurality of heating elements into a plurality of blocks, each block consisting of a predetermined number of spatially arranged heating elements of the plurality of heating elements corresponding to the plurality of nozzles, and sequentially driving each set of heating elements simultaneously driven over the respective blocks, in a time-divisional manner, the plurality of blocks arranged in first and second rows extending in a sub scanning direction and spaced apart from one another in a main scanning direction to form a zigzag array with end ones of the nozzles in the blocks in the first row overlapping end

93 sub
end
ones of the nozzles in the blocks in the second row; and
recording means for ejecting ink droplets from the nozzles corresponding
to the driven heating elements and impacting the ink droplets on the recording medium,
thus recording dots made of the ink droplets.

10. (Amended) A method for driving a recording head having a plurality of heating elements as driving elements for ejecting ink droplets from a plurality of nozzles, the plurality of heating elements being arranged in a direction substantially perpendicular to the direction of carrying a carried recording medium, the method comprising:

a drive signal generating step of generating an element drive signal made of necessary data for forming one dot so as to modulate the diameter of a dot by the number of ink droplets, using one or a plurality of ink droplets for forming one dot;

a time-division driving step of dividing the plurality of heating elements into a plurality of blocks, each block consisting of a predetermined number of spatially arranged heating elements of the plurality of heating elements corresponding to the plurality of nozzles, and sequentially driving each set of heating elements simultaneously driven over the respective blocks, in a time-divisional manner;

a correcting unevenness step of correcting unevenness of print density by controlling pulse number moderation; and

a recording step of ejecting one or a plurality of ink droplets from the nozzles corresponding to the driven heating elements and impacting the ink droplet(s) on the recording medium, thus recording dots made of the ink droplet(s).

16. (Amended) A method for driving a recording head having a plurality of heating elements as driving elements for ejecting ink droplets from a plurality of nozzles, the plurality of heating elements being arranged in a direction substantially perpendicular to the direction of carrying a carried recording medium, the method comprising:

a drive signal generating step of generating an element drive signal made of necessary data for forming one dot so as to modulate the diameter of a dot by the

number of ink droplets, using one or a plurality of ink droplets for forming one dot;

a time-division driving step of dividing the plurality of heating elements into a plurality of blocks, each block consisting of a predetermined number of spatially arranged heating elements of the plurality of heating elements corresponding to the plurality of nozzles, and sequentially driving each set of heating elements simultaneously driven over the respective blocks, in a time-divisional manner; and

a recording step of ejecting one or a plurality of ink droplets from the nozzles corresponding to the driven heating elements and impacting the ink droplet(s) on the recording medium, thus recording dots made of the ink droplet(s),

wherein at the drive signal generating step, record data made up of necessary data for forming one dot is compared with the number of pulses generated for determining the number of said ink droplets to be ejected from the nozzles, and the result of comparison is outputted as the element drive signal, and

wherein at the drive signal generating step, the record data is temporally divided into two, and the order of the pulses to be objects of comparison with the former half record data of the record data divided into two is determined so that a dot to be formed on the recording medium is equivalent to a dot formed by distributing the ink droplets in the direction of carrying the recording medium from a lattice point as the center, which is the position on the recording medium in forming one dot with one said ink droplet.

19. (Amended) A recording head having a plurality of heating elements as driving elements for ejecting ink droplets from a plurality of nozzles, the plurality of heating elements being arranged in a direction substantially perpendicular to the direction of carrying a carried recording medium, the recording head comprising:

drive signal generating means for generating an element drive signal made of necessary data for forming one dot so as to modulate the diameter of a dot by the number of ink droplets, using one or a plurality of ink droplets for forming one dot;

time-division driving means for dividing the plurality of heating elements into a plurality of blocks, each block consisting of a predetermined number of spatially

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arranged heating elements of the plurality of heating elements corresponding to the plurality of nozzles, and sequentially driving each set of heating elements simultaneously driven over the respective blocks, in a time-divisional manner;

distribution means for distributing the ejected ink drops on the carried recording medium using phase-corresponding data with respect to pulse numbers so that resultant dots formed thereon are oriented generally centrally about respective imaginary lattice points defining imaginary horizontal and vertical grid lines on the carried recording medium; and

recording means for ejecting one or a plurality of ink droplets from the nozzles corresponding to the driven heating elements and impacting the ink droplet(s) on the recording medium, thus recording dots made of the ink droplet(s).

25. (Amended) A recording head having a plurality of heating elements as driving elements for ejecting ink droplets from a plurality of nozzles, the plurality of heating elements being arranged in a direction substantially perpendicular to the direction of carrying a carried recording medium, the recording head comprising:

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drive signal generating means for generating an element drive signal made of necessary data for forming one dot so as to modulate the diameter of a dot by the number of ink droplets, using one or a plurality of ink droplets for forming one dot, the drive signal generating means having:

storage means for storing record data made up of necessary data for forming one dot;

pulse generating means for generating pulses for determining the number of said ink droplets to be ejected from the nozzles; and

comparing means for comparing the record data stored in the storage means with the number of pulses generated by the pulse generating means;

the drive signal generating means outputting the result of comparison made by the comparing means as the element drive signal;

time-division driving means for dividing the plurality of heating elements into a plurality of blocks, each block consisting of a predetermined number of spatially

arranged heating elements of the plurality of heating elements corresponding to the plurality of nozzles, and sequentially driving each set of heating elements simultaneously driven over the respective blocks, in a time-divisional manner; and

97 end
recording means for ejecting one or a plurality of ink droplets from the nozzles corresponding to the driven heating elements and impacting the ink droplet(s) on the recording medium, thus recording dots made of the ink droplet(s), wherein the drive signal generating means temporally divides the record data is temporally divided into two and determines the order of the pulses to be objects of comparison with the former half record data of the record data divided into two so that a dot to be formed on the recording medium is equivalent to a dot formed by distributing the ink droplets in the direction of carrying the recording medium from a lattice point as the center, which is the position on the recording medium in forming one dot with one said ink droplet.

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28. (Amended) An ink jet printer having a recording head having a plurality of heating elements as driving elements for ejecting ink droplets from a plurality of nozzles, the plurality of heating elements being arranged in a direction substantially perpendicular to the direction of carrying a carried recording medium, the ink jet printer being adapted for recording information including a character and/or an image in the form of dots made of ink droplets, the ink jet printer comprising:

drive signal generating means for generating an element drive signal made of necessary data for forming one dot so as to modulate the diameter of a dot by the number of ink droplets, using one or a plurality of ink droplets for forming one dot;

time-division driving means for dividing the plurality of heating elements into a plurality of blocks, each block consisting of a predetermined number of spatially arranged heating elements of the plurality of heating elements corresponding to the plurality of nozzles, and sequentially driving each set of heating elements simultaneously driven over the respective blocks, in a time-divisional manner;

correcting means for correcting unevenness of print density by controlling pulse number modulation; and

recording means of ejecting one or a plurality of ink droplets from the

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nozzles corresponding to the driven heating elements and impacting the ink droplet(s) on the recording medium, thus recording dots made of the ink droplet(s).

34. (Amended) A ink jet printer having a recording head having a plurality of heating elements as driving elements for ejecting ink droplets from a plurality of nozzles, the plurality of heating elements being arranged in a direction substantially perpendicular to the direction of carrying a carried recording medium, the ink jet printer being adapted for recording information including a character and/or an image in the form of dots made of ink droplets, the ink jet printer comprising:

drive signal generating means for generating an element drive signal made of necessary data for forming one dot so as to modulate the diameter of a dot by the number of ink droplets, using one or a plurality of ink droplets for forming one dot;

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time-division driving means for dividing the plurality of heating elements into a plurality of blocks, each block consisting of a predetermined number of spatially arranged heating elements of the plurality of heating elements corresponding to the plurality of nozzles, and sequentially driving each set of heating elements simultaneously driven over the respective blocks, in a time-divisional manner; and

recording means of ejecting one or a plurality of ink droplets from the nozzles corresponding to the driven heating elements and impacting the ink droplet(s) on the recording medium, thus recording dots made of the ink droplet(s);

wherein the drive signal generating means has:

storage means for storing record data made up of necessary data for forming one dot;

pulse generating means for generating pulses for determining the number of said ink droplets to be ejected from the nozzles; and

comparing means for comparing the record data stored in the storage means with the number of pulses generated by the pulse generating means;

the drive signal generating means outputting the result of comparison made by the comparing means as the element drive signal; and

wherein the drive signal generating means temporally divides the record